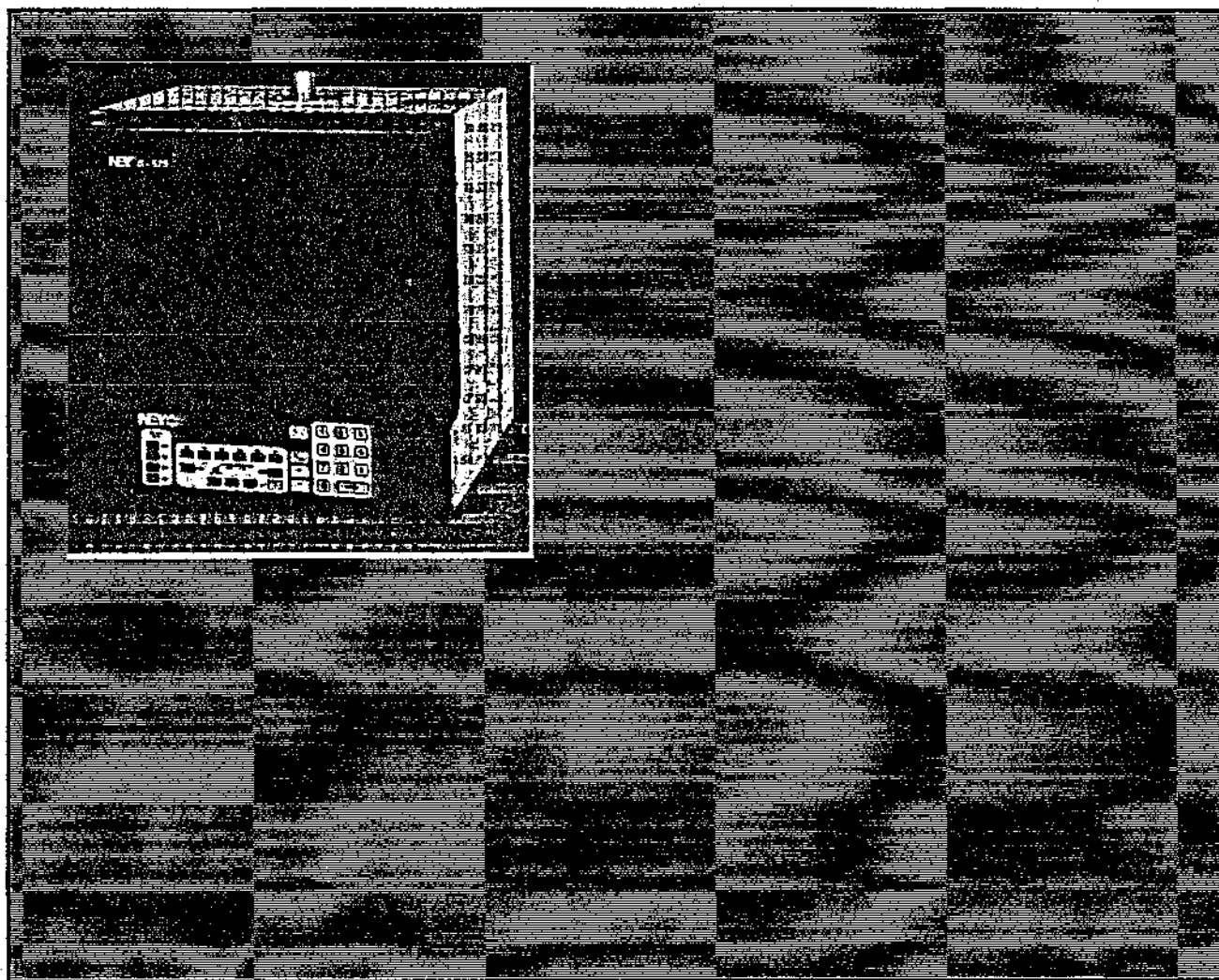


INSTALLATION, OPERATION and SERVICE MANUAL

MODELS: 6-525
6-160A
6-1350A



NEY 

6- 9363014 9014

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE NUMBER
I	Safety Precaution and MSDS	1-1
II	Receiving Information	2-1
III	Installation	3-1
IV	Features	4-1
V	Specifications	5-1
	Heating Curves	5-3
	Cooling Curves	5-4
VI	Furnace Description and Operation	6-1
	Control Panel Description	6-3
	Operating the Furnace	6-6
	Programming the Furnace	6-8
	Example	6-16
VII	Maintenance	7-1
VIII	Service	8-1
	Troubleshooting Charts and	
	Error Codes	8-2
	Schematics	8-4
	Disassembly Instructions	8-6
IX	Replacement Parts	9-1
	6-525 Parts	9-1
	Exploded View 6-525	9-2
	6-1350A Parts	9-3
	Exploded View 6-1350A	9-4
	6-160A Parts	9-6
	Exploded View 6-160A	9-7
X	Accessories	10-1
	Warranty	Inside Back Cover

SAFETY PRECAUTIONS and MSDS

Please read and follow the safety precautions listed below. These are intended for your safety and the safe operation of the equipment.

CAUTION

- * NEVER OPERATE THE FURNACE WITH COMBUSTIBLE MATERIALS ABOVE, ON TOP OF, OR IN CLOSE PROXIMITY TO THE FURNACE.
- * DO NOT USE TONGS OR OTHER TOOLS TO OPERATE THE CONTROLS.
- * KEEP THE DOOR IN THE CLOSED POSITION WHILE NOT IN USE.
- * DO NOT USE SOLVENTS OR LIQUID CLEANERS ON THE CONTROL PANEL.
- * DO NOT PLACE HOT ITEMS REMOVED FROM THE FURNACE ON TOP OR IN FRONT OF THE FURNACE.
- * DO NOT ATTEMPT TO SERVICE THE FURNACE UNTIL YOU HAVE READ AND UNDERSTOOD THE SERVICE INSTRUCTIONS INCLUDED IN THIS MANUAL.
- * ALWAYS TURN OFF THE POWER AND REMOVE THE LINE CORD FROM THE WALL OUTLET BEFORE SERVICING THE FURNACE.
- * ALWAYS VERIFY THAT THE FURNACE CONTROL IS DISPLAYING "door" BEFORE ATTEMPTING TO LOAD, UNLOAD, REACH INTO THE FURNACE CHAMBER WITH ANY TOOLS OR INSTRUMENTS.
- * USE ONLY INERT GASES WITH THE AIR EXCHANGE FEATURE.

WARNING

- > This furnace is not designed for use in hazardous (Class I, II, or III) locations as defined by the National Electric Code.
- > For personal safety, this furnace must be grounded.

The furnace power cord is equipped with a three prong (grounding) plug for use with wall receptacles to minimize the possibility of electric shock hazard from the furnace. The wall receptacles and circuit should be checked by a qualified electrician to make sure the receptacle is properly grounded.

Two prong wall receptacles must be replaced with three prong wall receptacles to ensure proper operation and safety. Two to three prong adaptors are not considered reliable, safe methods of electrical connection.

> This furnace must be connected to a properly sized power circuit with the correct overcurrent protection for safe and reliable operation.

> As a routine working precaution, always wear safety glasses and protective gloves when operating, loading and unloading the furnace. In addition wear respiratory protection when cleaning or servicing the muffle chamber.

MATERIAL SAFETY DATA SHEETS

On March 25, 1983 the Occupational Safety and Health Administration (OSHA) put the Hazard Communication Standard 29CFR 1910.1200 (better known as the "Right to Know") into effect.

This regulation became effective on November 25, 1985 for manufactures and distributors of products that OSHA has determined to be hazardous. Vitreous Aluminosilicate Cristobalite mineral dusts (in concentrations over 1 fiber per cubic centimeter) are included in the OSHA tables as air contaminants.

The J. M. Ney Company manufactures and sells products that use insulating refractories. These refractories contain Vitreous Aluminosilicate fibers. The ceramic fibers will form crystalline silica (Cristobalite) after operating at temperatures above 1600 degrees F. To comply with the OSHA regulations, Material Safety Data Sheets (MSDS) have been developed and are available to you upon request. This phase of the regulation took effect in 1986.

The information contained in the MSDS documents take into account the "Intended Use" of all products. It may not necessarily address all processes or procedures in your particular application. We highly recommend that you determine the health hazard in every pertinent operation including, but not limited to, installation, maintenance, cutting, sawing, drilling or filing the furnace insulation.

The MSDS documents and warning labels are for your training program to inform your employees of the hazards associated with the use of these products.

At the time of publication of this manual, The J. M. Ney Company is actively studying and performing test as to comply with the State of California law requiring that the public be informed of products containing materials which in some circumstances are carcinogenic in nature. At the conclusion of this analysis, additional information will be provided in new product Operator Manuals. Should you desire a copy of the findings, write The J. M. Ney Company, Yucaipa, CA, or call (714) 795-2461 and ask for Customer Service.

RECEIVING INFORMATION

UNPACKING

Carefully remove the furnace from the shipping carton. Save the carton and packing materials. The carton serves as the best container for transporting the furnace.

The shipping carton contains the following:

- One furnace
- Ceramic floor trays (1 each 8"(20cm)SQ - 6-525, 6-1350A)
 (2 each 4"(10cm)SQ - 6-160A)
- Exhaust port (6-525 top mount packed outside furnace during shipment)
 (6-160A, 6-1350A top mounted)
- Two exhaust port ball plugs
- One operator/service manual
- One Electrical Plug for Auxilliary Output
- One bottle of fiber-hardening agent (6-525 only)

LOSS OR DAMAGE

If there is any visible damage, do not attempt to operate the furnace. Note any external evidence of loss or damage on the freight way bill or express receipt and have it signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusal to honor your damage claim. The form required to file such a claim will be supplied by the carrier.

Concealed loss or damage means loss or damage which does not become apparent until the merchandise has been unpacked and inspected. Should either occur, make a written request for inspection by the carrier's agent within 15 days of the delivery date. Then file a claim with the carrier since the damage is the carrier's responsibility.

6-525 MUFFLE

The 6-525 muffle (heating chamber) is constructed in one piece. It is considered normal for cracks to appear on the surface, along edges and in the corners. This will not degrade or limit the performance or life of the muffle.

INSTALLATION

Remove all packing materials from inside and around the furnace. Select a benchtop location within five feet (1.5 meters) of the power receptacle. The furnace should be on a level surface at least 6 inches (16 cm) away from walls, other equipment, and heat sensitive materials. Do not mount under shelves or other structures that will restrict the flow of air. The furnace should be located under an exhaust hood if material or chemical reactions will be taking place inside the furnace.

The power receptacle should have the following overcurrent protection as follows:

- 6-525.....15 Amp fuse or circuit breaker
(100V units require 20 Amp)
- 6-160A, 6-1350.....20 Amp fuse or circuit breaker with receptacle for furnace only.

Firing trays are supplied with the furnace. Please place these in the muffle before the first firing. These will prevent molten materials from flowing into the muffle.

6-160A and 6-1350A ONLY: The air exchange feature on these furnaces is accessible from the rear of the furnace. If the integral fan is not to be used the rear damper panel must be lowered. The compressed air fitting (1/8" female NPT) is then accessible behind the damper panel.

If the top exhaust port is to be plugged, then it is recommended that the rear damper panel be lowered. This will minimize the escape of hot air from around the door and resulting discolored paint.

6-525 ONLY: The exhaust port along with mounting screws are packed in the top packing insert. Locate the port and install it on top of the furnace.

FEATURES

GENERAL

- > Six Stages (Segments) Of Temperature Control
- > Four User Definable Stored Programs (Chainable Into 24 Stages Total)

- > Programmable Auxiliary Output (5 Amp Max. Normally Open Switched Contact)
- > Long Life Battery (Lithium) Backup Of Program Parameters

- > Power Interruption Cycle Continuation (Power Outage Return)
- > Digital PID (Proportional, Integral, Derivative) Temperature Control

- > Delay Start Of Operation Timer
- > High Temperature Range To 1100°C (2012°F)

- > Hold Feature For Cycle Interruption Or Infinite Hold Capability
- > Negative Rate (Ramp) Temperature Control

- > 0.1 Degree Per Minute Rate (Ramp) Resolution
- > Programmable High Limit Cutoff

- > "LO" Battery Indicator
- > Various Diagnostic Indications.
- > Type K Thermocouple

6-525

- > Large Low Thermal Mass Fiber Muffle - Fast Heat and Cool Rates

6-160A

- > Integral Fan for Forced Air Exchange
- > Compressed Air Exchange Fitting (1/8" NPT Female)
- > Vertical Lift Door
- > Firebrick Lined Muffles

6-1350A

- > Integral Fan for Forced Air Exchange
- > Compressed Air Exchange Fitting (1/8" NPT Female)
- > Largest Firebrick Lined Muffle

SPECIFICATIONS

ELECTRICAL:

	6-525	6-1350A	6-160A
Power requirements in watts at nominal line voltage:	1500	4000 @220V 4780 @240V	1800
Watts to maintain 1000C:	1100	3500*	1600*
Nominal current 50/60Hz in Amps at line voltage of			
100 Volts:	15.0	NA	18
120 Volts:	12.5	NA	15
220 Volts:	6.8	18.2	8.2
240 Volts:	6.3	19.9	7.5

* Fan set to maximum and damper open

MECHANICAL:

		6-525	6-1350A	6-160A
Furnace:	Width:	39cm(15.5in)	74cm(29in)	41cm(16in)
	Depth:	37cm(14.5in)	56cm(22in)	33cm(13in)
	Height:	42cm(16.5in)	53cm(21in)	42cm(16.5in)
Muffle (Inside):	Width:	23cm(9in)	30cm(12in)	23cm(9in)
	Depth:	23cm(9in)	32cm(12.5in)	11.5cm(4.5in)
	Height:	17cm(6.5in)	23cm(9in)	10cm(4in)
Furnace Weight:		16Kg(35 lbs)	73Kg(160 lbs)	20Kg(44 lbs)
Shipping Weight:		21Kg(46 lbs)	95Kg(210 lbs)	27Kg(60 lbs)
Maximum Muffle Load:		6.8Kg(15 lbs)	13.6Kg(30 lbs)	6.8Kg(15 lbs)

OPERATIONAL:

Temperature Control Range and Resolution: (1000°C max with full air exchange rate on 6-160A and 1350A)	100°C to 1100°C at 1°C (212°F to 2012°F at 1°F)
Temperature Control Accuracy:	+/- 5°C (9°F) in control range from 100°C to 1100°C (752°F to 2012°F).
Amplitude at Setpoint.	Less than +/- 3°C (5.5°F)
Settable Heat RATE Range: in 0.1°C (0.2°F) increments	0°C(0°F) to 40°C(72°F)/MIN

Note: See following graphs for actual expected heat rate performance. 40°C(72°F)/MIN is not possible at the maximum temperatures, air exchange, or with maximum loads.

Programmable Parameter Ranges and Presets:

Parameter	Increment	Minimum	Maximum
DELAY START	1 Hour	0 Hour	99 Hours
RATE	0.1 deg/min	0°C/min (0°F/min)	40°C/min (72°F/min)
TIME	0.1 Hour	0.0 Hour	499.9 Hour
TEMP	1 deg	100°C (212°F)	1100°C (2012°F)
Programmable High Limit Cutoff	1 deg	500°C (932°F)	1100°C (2012°F)

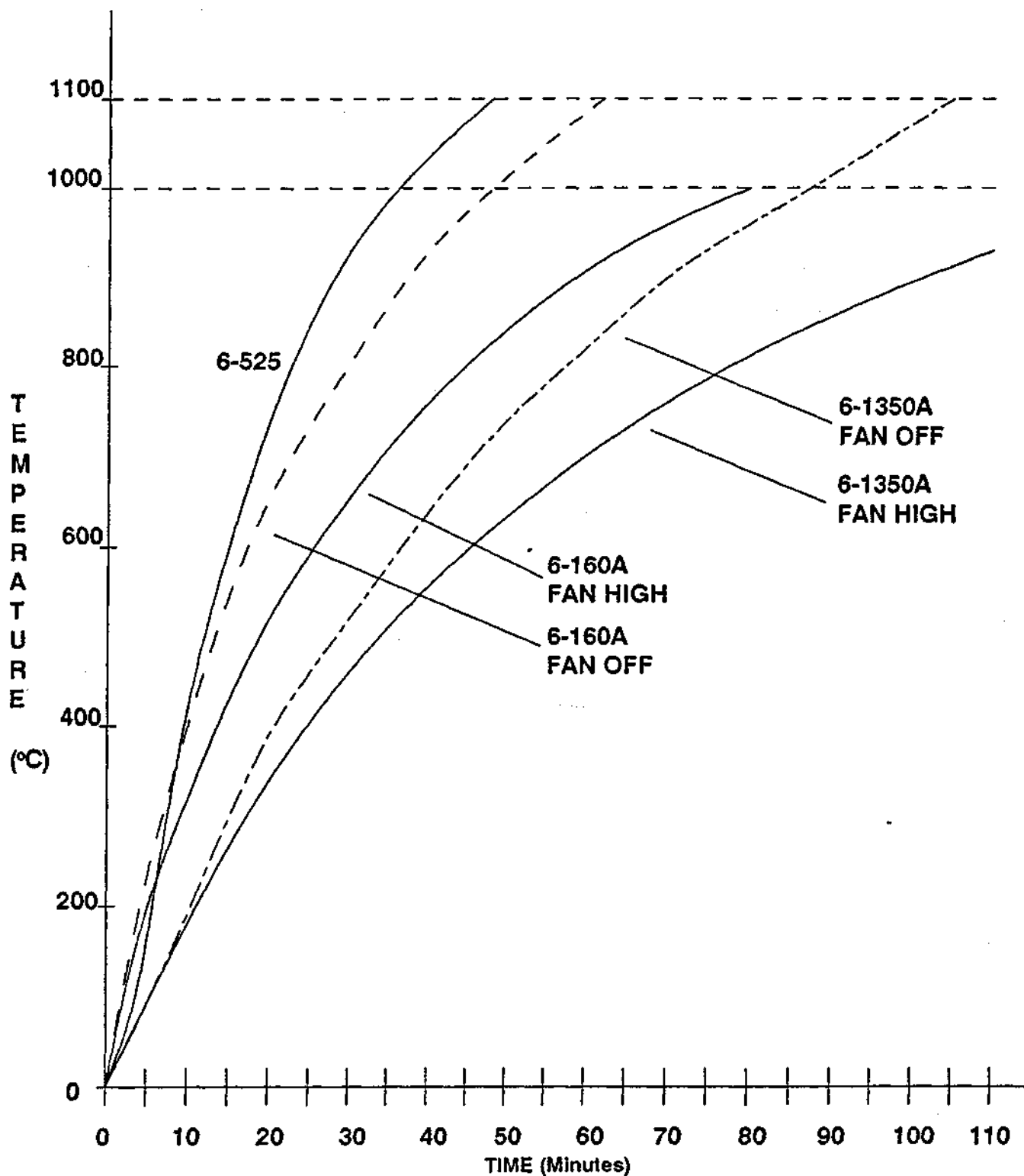
End Of Cycle Operation:**Factory Preset:**

(1) Hold last temperature and beep every 6 minutes.

Options:

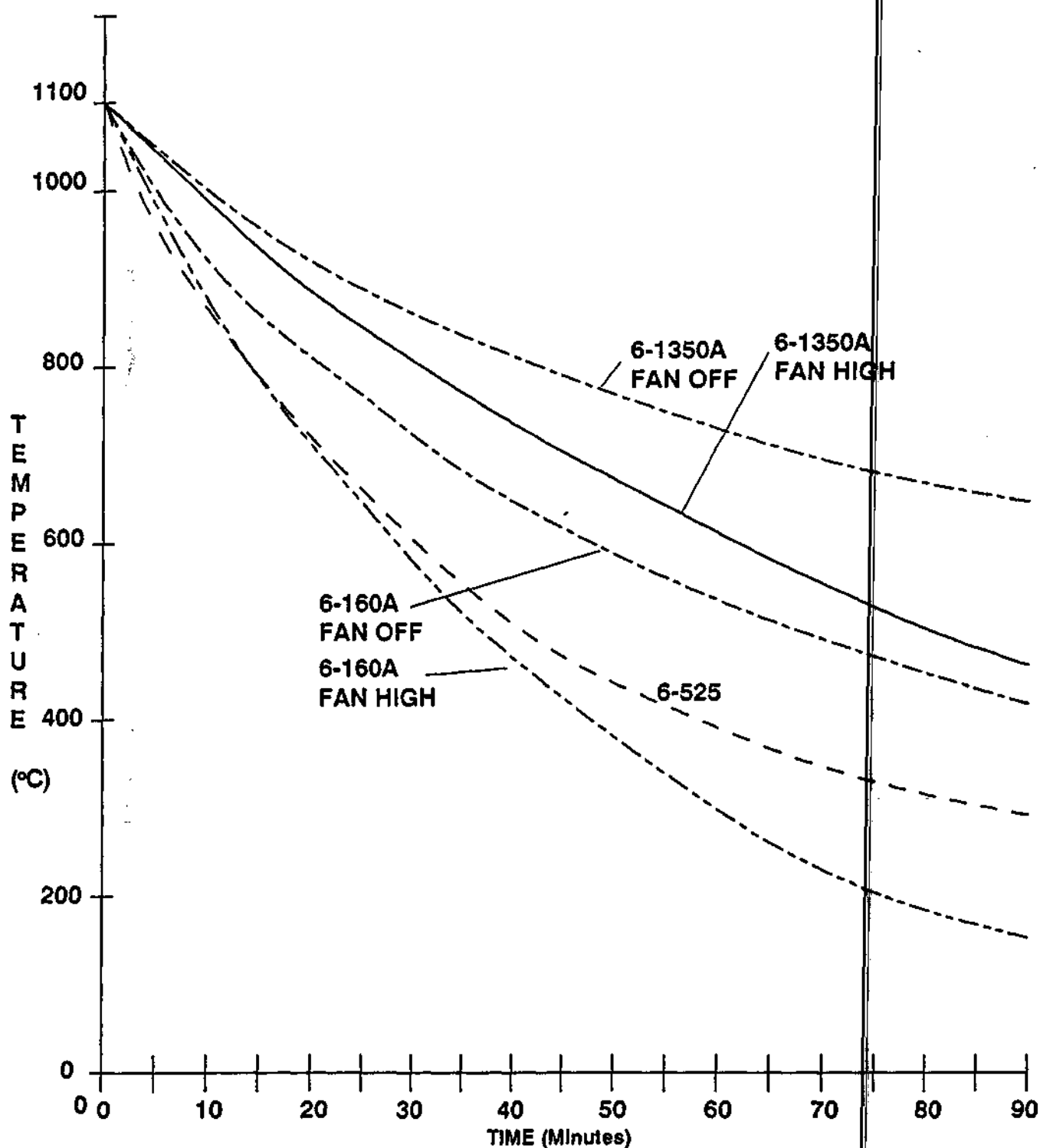
- (2) Hold last temperature no beep
- (3) Turn off after last TIME (muffle off)
- (4) Repeat cycle continuously

HEATING CURVES:



TEST CONDITIONS: Nominal Line Voltage; No Load In Muffle; Full Power Applied To Muffle; 6-160A and 6-1350A with Internal Fan Set To 0 for OFF and 9 for MAX.

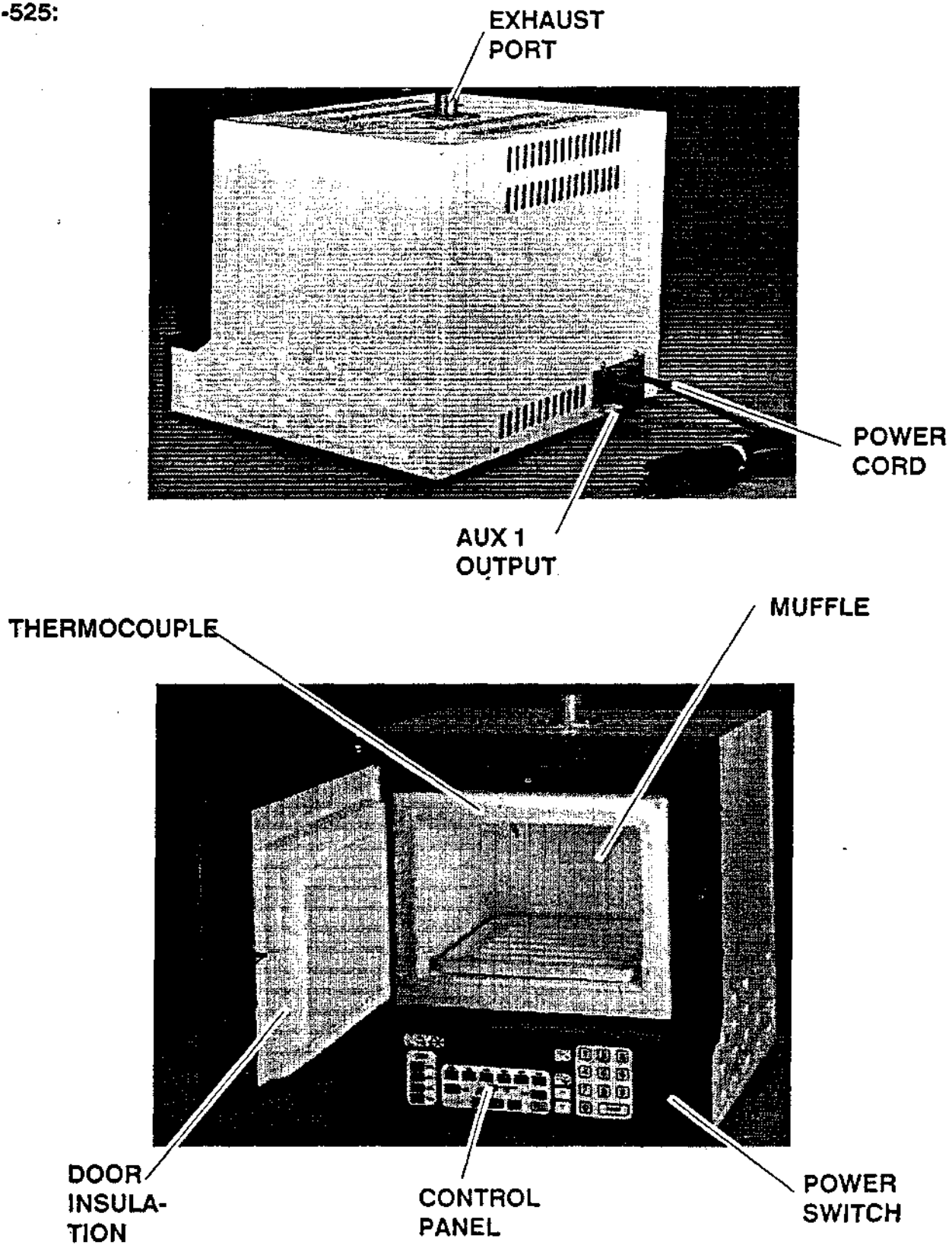
COOLING CURVES:



TEST CONDITIONS: No Load In Muffle; No Power Applied To Muffle; 6-160A and 6-1350A with Internal Fan Set To 0 for OFF and 9 for MAX.

FURNACE DESCRIPTION AND OPERATION:

6-525:



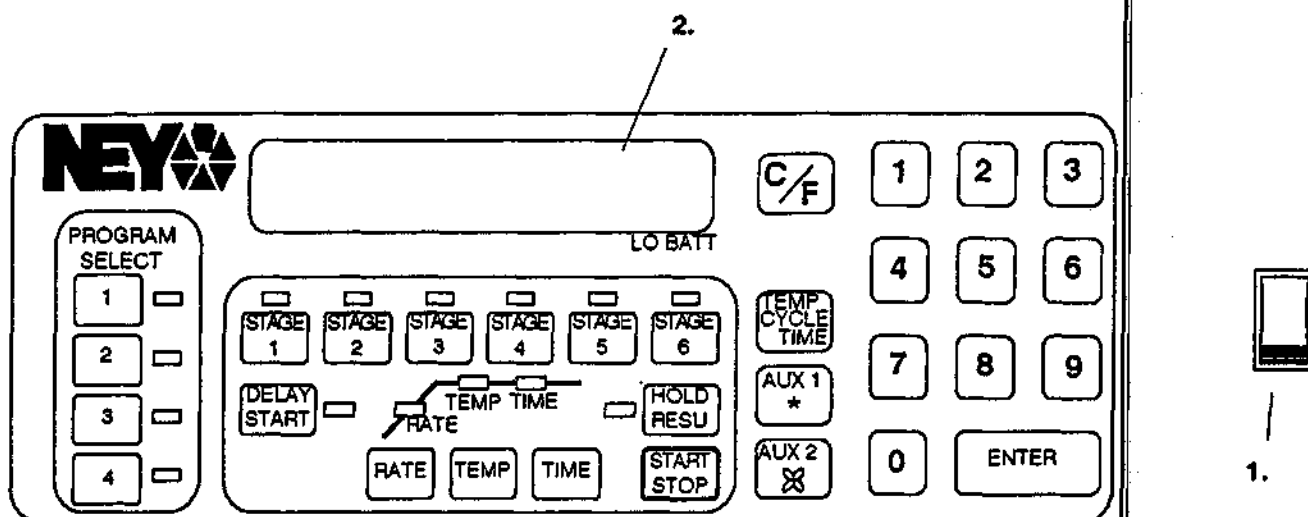
6-160A:



6-1350A:



CONTROL PANEL DESCRIPTION:



NOTE: 1350A KEY LOCATIONS ARE SLIGHTLY DIFFERENT BUT PERFORM THE SAME OPERATIONS.

1. **POWER SWITCH** Turns main power on and off to furnace. Does not start furnace operation.
2. **DIGITAL DISPLAY**
"LO BATT" Displays operating and programmed temperatures, times and status conditions. The right most decimal point in the display is used to indicate a low battery condition.
3. **°C / °F** Changes temperature display from degrees Celsius to degrees Fahrenheit. This key is only active when the current muffle temperature is being displayed. It is locked when displaying programmed parameters.
4. **DELAY START** Turns the furnace on at a later time and runs the preselected cycle. Also gives operator access to program the amount of delay time desired. Pressing the DELAY START key causes the DELAY START LED to flash and the current value to be displayed. A new value can be programmed or the START/STOP key can be pressed to start a cycle after a delay.
5. **RATE** Displays the currently programmed RATE for the selected program and stage. Gives the operator access to program the desired value.

RATE refers to the desired temperature increase or decrease in tenths of a degree per minute (xx.x°/min). The decrease in temperature or cooling is limited by the natural cooling RATE of the furnace and its load. The control can force it to be slower but not faster. See the heating and cooling curves in Section 5.

Programming a TEMP lower than the previous TEMP will cause a negative RATE. Similarly, starting the furnace with the muffle temperature higher than the first TEMP 1 will cause the control to cool at RATE 1 to TEMP 1.

Programming a RATE to zero prevents that stage and the following stages from running. For example if RATE 4 is set to zero only stages 1, 2 and 3 will operate and the program will end after stage 3.

6. TEMP

Displays the currently programmed temperature for the selected program and stage. Also gives the operator access to program the desired temperature value. When the corresponding LED is flashing, that TEMP is being reviewed and can be programmed.

7. TIME

Displays the currently programmed time for the selected program and stage. Also gives the operator access to program the desired time value. When the corresponding LED is flashing, that TIME is being reviewed and can be programmed.

8. HOLD / RESUME

Pressing the HOLD/RESUME key, when a cycle is operating, holds the current temperature indefinitely. The HOLD/RESUME LED will light along with the LED for the portion of the cycle operating when the key was pressed. Pressing the key a second time will resume the cycle from the hold point.

When a cycle is held with the HOLD/RESUME key the program parameters can be changed on any stage of the selected program. Resuming the cycle causes the control to use the newly programmed parameters.

- 9. TEMP / CYCLE TIME** Resets the display to the current muffle temperature if parameters are being reviewed or programmed. Displays the cycle time remaining in a TIME segment during operation.

- 10. START / STOP** Starts the furnace. The cycle will operate as programmed. Stops the cycle if the furnace is operating. Restarting a cycle that has been stopped with the START/STOP key will restart it from the beginning.
- 11. Digit or Numeric Keys** Used to enter temperatures, times, and heat rates. When entering a value, any incorrect entry can be changed by reentering the correct value. The incorrect value will disappear off the left side of the display.
- 12. ENTER** Confirms the Numeric Key entries and stores them in the control's memory.
- 13. Parameter LED's** LED's in the graph next to the switches are used to indicate control status.
- 14. PROGRAM SELECT 1-4** Selects PROGRAM to be reviewed, programmed, or run by the control. A new program can be selected whenever the control is not running the current program.
- 15. STAGE 1-6** Selects the STAGE (segment) of the selected program to be reviewed or programmed. The stages of the currently selected program can be reviewed at any time. The corresponding LED lights with each key and goes out in seven seconds if a parameter key (RATE, TEMP, TIME, AUX) is not pressed. Stage parameters can be reprogrammed only when the control is not running the current program or when the current program has been put on "HOLD".
- All the STAGE LED's that are programmed light when the furnace is started. They go out in sequence as each STAGE is completed.
- 16. AUX 1** Normally open electrical contact output that can be programmed to turned on and off as the furnace runs the preprogrammed cycle. The AUX 1 output can be programmed to be on or off independently for each segment of a cycle. The IEC socket on the back of the furnace provides a 5 amp max fused contact closure when turned on.

See the auxiliary output section that follows.

17. AUX 2

NOTE: NOT APPLICABLE TO 6-525

The AUX 2 key controls the air exchange fan located on the back of the furnace. The AUX 2 or air exchange fan can be programmed to be on at a particular level or off independently for each stage of a cycle or program. The speed of the fan (0 for OFF and 9 for MAX) which is related to the number of air exchanges can also be programmed.

NOTE: High air exchange rates will reduce the maximum possible heat rates and temperatures.

Door Switch (not shown)

Internal switch deactivated by door opening which causes the control to disconnect the muffle from both sides of the power line.

Thermocouple

Type K thermocouple located in the rear of the muffle to measure chamber temperature for the control.

Auxillary Output

Rear connection for AUX 1 described previously.

OPERATING THE FURNACE:

POWER ON:

Turning on the power switch activates the control. The control performs a self-test for approximately three seconds and displays the model number (ie. 525, 160A, or 1350A). At the end of the self-test the actual muffle temperature is displayed.

If an operating cycle is stopped with the START/STOP key, pressing the key a second time will restart the cycle from the beginning. If the muffle is at an elevated temperature, the control will use the programmed RATE 1 for the cooling or heating to TEMP 1.

If the model number is not displayed or the display sequences through all the model numbers listed on the front cover; see BATTERY REPLACEMENT and CONFIGURATION SETUP in Maintenance Section 7.

The furnace's operation can be changed in several ways by changing the "default settings". These are the preselected parameters the factory entered when the unit was tested. For more information about these see CONFIGURATION SETUP later in this section under programming.

REVIEWING THE PROGRAM:

The current stored programs can be reviewed by selecting a program, stage, and parameter keys to display the values. The first step is to press a PROGRAM key followed by a particular stage key for that program. Pressing the TEMP, RATE, TIME, or AUX keys displays the current value for that stage and program. The displayed parameter is replaced with the current muffle temperature by pressing the TEMP / CYCLE TIME key.

STARTING THE FURNACE WITHOUT A DELAY START:

The current program can be started by pressing the START/STOP key. The display continues to display the muffle temperature as the muffle heats up. The LED's in the programmed cycle are turned on when the key is pressed. They are individually turned off as each function is completed. Any one of the four furnace programs can be started in this way.

Programs can be chained together (run in groups) by pressing and holding the first program key in the chain. While this key is held down, press the additional programs to be chained to the first program. The LED for each program that is selected will light. Two, three, or four programs can be chained in their number sequence. (For example 1-2-3-4, 1-2, 3-4, 1-3-4, 2-4). Pressing the START/STOP key starts the first program in the chain. The other programs follow the first in sequence.

STARTING THE FURNACE WITH A DELAY START:

A value for the DELAY START must be programmed first (The default value is preprogrammed to zero). Press the DELAY START key followed by the digit keys of the desired amount of delay in hours. The DELAY START LED will flash and the programmed value will be displayed. Pressing the ENTER key will store this value and turn off the DELAY START LED. Pressing the DELAY START key again will activate the function, flash the LED, and display the delay value in hours. Pressing the START/STOP key will start the delay followed by the selected program. The DELAY START LED will be on during the delay.

FURNACE OPERATION:

During cycle operation all the indicating LED's (Program and Stage) for a cycle will initially light and go out as that portion of the cycle is completed. The RATE and TIME - TEMP LED's will alternately come on. If a DELAY START has been selected, its LED will light first and when the delay is complete the rest of the cycle LED's will light.

A flashing RATE LED indicates that the control is unable to maintain the programmed rate of change in temperature. The flashing is only an indication for the operator; the furnace will continue the cycle uninterrupted. This condition can be caused by programming the furnace with high programmed RATE, large loads, or low power line voltages. Refer to the heating and cooling curves in the SPECIFICATIONS section 5 for more information.

A power outage or turning off the power when the furnace is in the idle or off mode does not cause a loss of the programs. The furnace will resume a delay start cycle if a power interruption occurs during its operation. A power outage when the furnace is heating will result in the resumption of the cycle when power is reapplied, if the muffle temperature has dropped less than 50°C (90°F). If the muffle temperature has dropped more than 50°C (90°F) the furnace turns off. If power is interrupted or the power switch is turned off when the furnace is operating at less than 100°C, the furnace will turn on when power is reapplied.

HOLDING A TEMPERATURE:

The furnace can be stopped or held in the middle of a cycle indefinitely by pressing the HOLD/RESUME key. The muffle temperature, when the key is pressed, will be maintained with the associated HOLD LED, STAGE LED, and parameter LED on. Pressing the key a second time releases the control and it resumes the cycle that it had been operating. The program parameters can be reprogrammed when the control is put in the HOLD mode.

END OF CYCLE:

The default "End Of Cycle" maintains the last programmed temperature, displays "HOLD" and beeping every six minutes. Other "End Of Cycle" operations available include maintaining the last programmed temperature without beeping, turning off the muffle at the end of the cycle while displaying "END", and continuously repeating the cycle. The end of cycle default setting can be changed by following the directions outlined later in this section under CONFIGURATION SETUP.

PROGRAMMING THE FURNACE

The furnace control parameters can only be changed during idle mode (not running a cycle) or when put on hold during a cycle with the HOLD/RESUME key. If an out of range value is entered the control beeps and displays the maximum or minimum acceptable value. The previous stored value is retained.

DELAY START:

Pressing the DELAY START key displays the current programmed value and flashes the associated LED. When the LED is flashing, the DELAY START value can be reprogrammed by keying in a new value followed by the ENTER key. If the value already stored for the delay start is acceptable, then either the ENTER key or the TEMP / CYCLE TIME key can be pressed to save the value. If an incorrect digit key is pressed while entering a parameter, the correct parameter should be reentered. The incorrect digit will shift off the display to the left. An alternate method to clear an incorrect entry is to press the DELAY START key a second time.

PROGRAMS:

Any one of the four programs can be selected for operation or programming independently. Pressing a PROGRAM key activates that program and the associated LED lights.

Programs can be chained together (run in groups) by pressing and holding the first program key in the chain. While this key is held down, press the additional programs to be chained to the first program. The LED for each program that is selected will light. The group selected in the chained is not stored in memory and must be assigned each time it is requested. Each individual program is stored and can be operated independently.

STAGES:

Once a program has been selected the individual stage RATE's, TEMP's, TIME's, and AUX's can be programmed. A STAGE key has to be pressed before the various parameters can be programmed. After the key is pressed the STAGE LED will remain on for 7 seconds if no other keys are pressed. If one of

the parameter keys is pressed, it will remain on until the ENTER or TIME/TEMP key is pressed. If the LED goes out, the STAGE key must be pressed again.

RATES:

The RATE key sets heat rate or temperature increase rate. Pressing the RATE key displays the current value for the program and stage selected. The corresponding RATE LED also flashes.

While the RATE LED is flashing, a new RATE can be entered on the keyboard. If an incorrect digit key is pressed while entering a parameter, the correct parameter should be reentered. The incorrect digit will shift off the display to the left. Once the correct value is displayed, save it by pressing the ENTER key. If the ENTER key is not pressed, the original value will be retained and the new value will be lost. After the ENTER key is pressed, the display returns to the current muffle temperature.

Entering a 0 for any RATE (2 through 6) causes the cycle to end after the previous stage. (Example: RATE 4 = 0; Program ends after STAGE 3). Programming RATE 1 to 0 causes the program to start with STAGE 2.

TEMPERATURES:

The TEMP key sets the muffle temperature. Pressing the TEMP key displays the current value for the program and stage selected. The corresponding TEMP LED also flashes.

While the TEMP LED is flashing, a new temperature can be entered on the keyboard. If an incorrect digit key is pressed while entering a parameter, the correct parameter should be reentered. The incorrect digit will shift off the display to the left. Once the correct value is displayed, save it by pressing the ENTER key. If the ENTER key is not pressed, the original value will be retained and the new value will be lost. After the ENTER key is pressed, the display returns to the current muffle temperature.

TIMES:

The TIME key sets the length of the hold time at the programmed temperature. Pressing the TIME key displays the current value for the program and stage selected. The corresponding TIME LED also flashes.

While the TIME LED is flashing a new time can be entered for the selected STAGE on the keyboard. If an incorrect digit key is pressed while entering a parameter, the correct parameter should be reentered. The incorrect digit will shift off the display to the left. Once the correct value is displayed, save it by pressing the ENTER key. If the ENTER key is not pressed, the original value

will be retained and the new value will be lost. After the ENTER key is pressed, the display returns to the current muffle temperature.

Setting the last TIME to 0 causes the control to end the cycle and shut off. The muffle temperature is not held. The last TIME can be TIME 6 or the TIME immediately before a RATE set equal to zero.

AUXILIARY OUTPUT #1:

The AUX 1 output is a normally open electrical contact accessible to the user in the rear of the furnace close to the power cord. A adaptor plug is supplied in the accessory kit to make the connections. The socket for AUX 1 is fused at 5 amps with the fuses mounted in the socket.

The AUX 1 contacts can be independently closed (ON) or opened (OFF) for each STAGE of each PROGRAM. The AUX 1 is programmed to be ON (contacts closed) by selecting a STAGE key of a program followed by the AUX 1 key. "AUX1 ON *" will be displayed if it was previously programmed to be off. Pressing the AUX 1 key a second time turns it off. "AUX1 OFF" is displayed. "*" is displayed in the far right character of the display when AUX 1 is on and the cycle is running.

AUXILIARY OUTPUT #2:

The AUX 2 output (NOT APPLICABLE TO 6-525) controls the air exchange fan feature. The air exchange fan is located on the back of the furnace. A vertical damper is provided to block fan air from entering the furnace when moved into the down position. Putting the damper in this position also provides access to the compressed air fitting. When the damper is in the up position, the fan will force pre-heated air into the furnace. If the exhaust port is plugged when the fan is operating, the exhaust gas will escape around the door and discolor the paint.

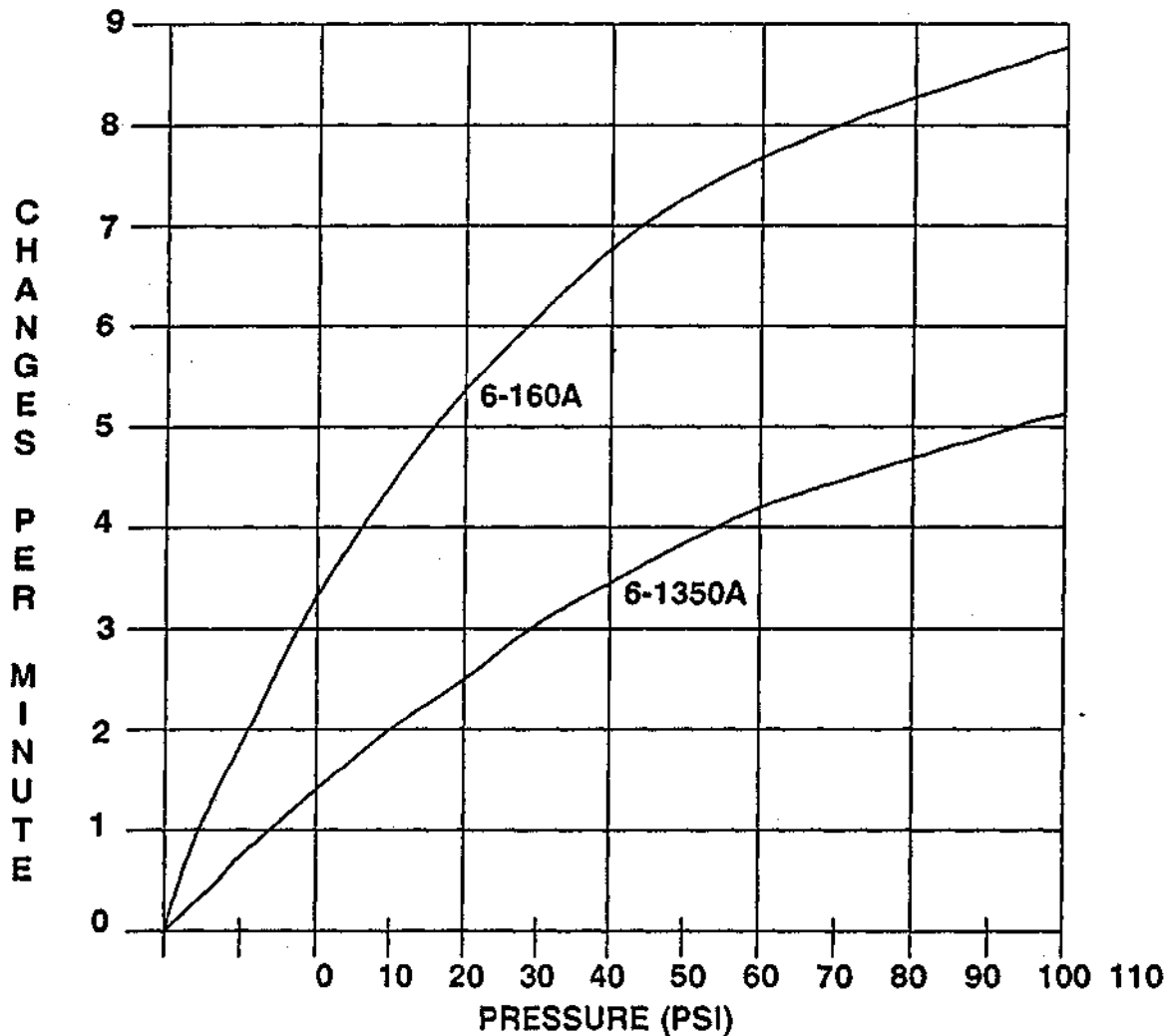
The air exchange fan can be programmed to be OFF or ON at a particular speed for each stage. The fan is programmed to be ON by pressing a STAGE key of a program followed by the AUX 2 key. With "SELECT 0" being displayed a digit key (1-9) can be pressed to set that speed. 1 is the slowest and 9 is the fastest. Entering a 0 turns the fan to the lowest speed (the fan is always on at a slow speed to prevent its possible overheating). A setting of 9 produces approximately 5 air changes a minute in the muffle. Pressing the "ENTER" key stores the setting.

A fan symbol "-|-" will appear in the far left character of the display. The two bars in the display will rotate at a speed relative to that programmed. If 1 is

programmed they will rotate slow. If 9 is programmed they will rotate fast. During cycle operation this symbol will appear when ever the fan is programmed to be on.

Compressed air or inert gas can also be ported into the furnace muffle via the rear female 1/8"NPT fitting. This fitting is located behind the fan damper. Lower the damper for access. The gas will be preheated by the bottom heating plate and injected into the front of the furnace. The graph below gives an approximate relationship between changes per minute and gas pressure.

COMPRESSED GAS CHANGES GRAPH:



CONFIGURATION SETUP:

The furnace has other features or operations that are only accessible when power is applied (power up). These features are programmed by pressing the ENTER key during the 3 seconds after power up when the furnace displays the model number. "SELECT" will appear on the display to indicate configuration setup.

The following selections are available for programming.

END OF CYCLE:

- (1) Pressing the 1 key followed by the ENTER key will cause the control to continuous hold the last TEMP and beep every 6 minutes. "HOLD TEMP" is displayed. (This is the factory preset.)
- (2) Pressing the 2 key followed by the ENTER key will cause the control to continuous hold the last TEMP without beeping. "HOLD TEMP" is displayed.
- (3) Pressing the 3 key followed by the ENTER key will cause the control to end the cycle and shut off the muffle after the last TIME. "END" is displayed and the control beeps three times.
- (4) Press the 4 key followed by the ENTER key will cause the control to continuously repeat the cycle that has been started.

HIGH LIMIT CUTOFF:

- (5) Pressing the 5 key followed by the ENTER key will cause the current High Limit Cutoff temperature to be displayed (1100C is the factory preset value). To select a different temperature enter the new value using the digit keys followed by the ENTER key. CAUTION: Previously programmed values for TEMP's must be lower than High Limit Cutoff.

The furnace will now shut down and display "Err3" if the muffle temperature goes above the programmed High Limit Cutoff. The error is cleared by turning off the furnace. Attempting to program a temperature higher than the High Limit Cutoff will cause the control to beep and display the maximum temperature.

SYSTEM RESET: CAUTION!!!

- (7) Press the 7 key followed by the ENTER key will cause the control to reset all the parameters and settings in the control. "Reset" will be displayed. This is for diagnostics and system checking.

Refer to Configuration Setup in the maintenance section 7 for further directions.

To end the configuration setup routine press the 9 key followed by the ENTER key. The control will go into normal operation displaying the current muffler temperature.

EXAMPLE

SITUATION:

You wish to do a six stage temperature profile. The following heating rates, temperatures and holding times are desired.

1.	RATE=45°F/min	TEMP=500°F	TIME=.3 Hour
2.	RATE=10°F/min	TEMP=760°F	TIME=.5 Hour
3.	RATE=5°F/min	TEMP=1200°F	TIME=1.7 Hours
4.	RATE=10°F/min	TEMP=1760°F	TIME=3 Hours
5.	RATE=-.5°F/min	TEMP=1510°F	TIME=.1 Hours
6.	RATE=-10°F/min	TEMP=1000°F	TIME=30 Hours

- ASSUMPTIONS:**
1. Furnace is turned on.
 2. The muffle is cool.
 3. The muffle temperature is being displayed in degrees Fahrenheit. Press °C/°F key, if current displays is in °C.
 4. The load is inside the muffle on a ceramic tray.
 5. Program will be stored in PROGRAM 1. Press PROGRAM 1 key, if PROGRAM 1 LED is not on.

PROGRAMMING STEPS:

STEP	PRESS KEY	ACTION
1.	RATE	Press key until the RATE 1 LED flashes.
2.	4 - 5 - 0	45.0 °F/min
3.	ENTER	RATE 1 is now programmed.
4.	TEMP	Press key until the TEMP 1 LED flashes.
5.	5 - 0 - 0	500°F
6.	ENTER	TEMP 1 is now programmed
7.	TIME	Press key until the TIME 1 LED flashes.
8.	3	0.3 Hour
9.	ENTER	TIME 1 is now programmed.

STAGE 1 IS NOW PROGRAMMED.

10.	RATE	Press key until the RATE 2 LED flashes.
11.	1 - 0 - 0	10.0 °F/min
12.	ENTER	RATE 2 is now programmed.
13.	TEMP	Press key until the TEMP 2 LED flashes.
14.	7 - 6 - 0	760°F
15.	ENTER	TEMP 2 is now programmed
16.	TIME	Press key until the TIME 2 LED flashes.
17.	5	0.5 Hour
18.	ENTER	TIME 2 is now programmed.

STAGE 2 IS NOW PROGRAMMED.

19.	RATE	Press key until the RATE 3 LED flashes.
20.	5 - 0	5.0 °F/min
21.	ENTER	RATE 3 is now programmed.

22.	TEMP	Press key until the TEMP 3 LED flashes.
23.	1 - 2 - 0 - 0	1200°F
24.	ENTER	TEMP 3 is now programmed
25.	TIME	Press key until the TIME 3 LED flashes.
26.	1 - 7	1.7 Hours
27.	ENTER	TIME 3 is now programmed.

STAGE 3 IS NOW PROGRAMMED.

28.	RATE	Press key until the RATE 4 LED flashes.
29.	1 - 0 - 0	10.0°F/min
30.	ENTER	RATE 4 is now programmed.
31.	TEMP	Press key until the TEMP 4 LED flashes.
32.	1 - 7 - 6 - 0	1760°F
33.	ENTER	TEMP 4 is now programmed
34.	TIME	Press key until the TIME 4 LED flashes.
35.	3 - 0	3.0 Hours
36.	ENTER	TIME 4 is now programmed.

STAGE 4 IS NOW PROGRAMMED.

37.	RATE	Press key until the RATE 4 LED flashes.
38.	5	0.5 °F/min
39.	ENTER	RATE 5 is now programmed.
40.	TEMP	Press key until the TEMP 4 LED flashes.
41.	1 - 5 - 1 - 0	1510°F
42.	ENTER	TEMP 5 is now programmed
43.	TIME	Press key until the TIME 4 LED flashes.
44.	1	0.1 Hour
45.	ENTER	TIME 5 is now programmed.

STAGE 5 IS NOW PROGRAMMED.

46.	RATE	Press key until the RATE 6 LED flashes.
47.	1 - 0 - 0	10.0°F/min
48.	ENTER	RATE 6 is now programmed.
49.	TEMP	Press key until the TEMP 6 LED flashes.
50.	1 - 0 - 0 - 0	1000°F
51.	ENTER	TEMP 6 is now programmed
52.	TIME	Press key until the TIME 6 LED flashes.
53.	3 - 0 - 0	30.0 Hours
54.	ENTER	TIME 6 is now programmed.

STAGE 6 IS NOW PROGRAMMED.

After TIME 6 the control will continue to hold the last temperature (TEMP 6) until turned off while beeping every 6 minutes.

MAINTENANCE

CLEANING:

Vacuum (rather than blow) any muffle dust found in and around the furnace. This will minimize the airborne dust.

SEE SECTION 1: SAFETY PRECAUTIONS and MSDS

Clean the control panel with a soft dry cloth. Do not use water, liquids or spray cleaners on the panel or on the cloth. These cleaners can enter the switch panel and cause damage.

Clean the furnace cabinet with any household non-abrasive cleaner and a soft cloth.

CALIBRATION:

Under normal use the furnace will not require calibration. Situations where calibration may be required include thermocouple damage and replacement, control/power pc board assembly replacement.

An electronic temperature meter, if available, should be used to calibrate the furnace. If one is not available, then the boards and thermocouples should be used as supplied. They have been precalibrated at the factory and will be more accurate than other methods of calibration.

If an electronic temperature meter is used then its thermocouple sensor should be placed in the center of the muffle half way between the top and bottom. Program the furnace to heat to 960°C at a rate of 20°C /min and start the control. After the furnace reaches 960°C, wait 30 minutes for the muffle temperature to stabilize. Record the temperature measured by the electronic temperature meter as the difference between 960 and its reading. For example if the meter reads 980 then the difference is +20°C. If the meter reads 950 then the difference is -10°C.

Once a measurement has been recorded, turn off the furnace and unplug its power cord. Allow the furnace to cool to room temperature. Remove the control panel by following the directions under "Control Panel Removal" in section 8. The following directions apply once the control panel is opened.

The trimmer/potentiometer labeled R12 "SPAN ADJ" (see page 8-4) on the computer/power printed circuit board assembly (horizontally mounted pcb) will be adjusted to correct the calibration. If the muffle temperature measures higher (positive difference in example above) than the furnace indicates, turn

the trimmer/potentiometer labeled R12 "SPAN ADJ" clockwise (CW) to reduce the display temperature. The potentiometer should be turned one complete turn for every 10°C of difference. If the temperature measures lower (negative difference) adjust the potentiometer counterclockwise (CCW) using the same ratio.

BATTERY REPLACEMENT:

If the program contents are lost when the furnace power is turned on and off, then the battery is dead. In addition, if the "Low Batt" indicator flashes the battery should be replaced. The battery in question is a small Lithium coin type battery (#2032).

Refer to the CONTROL PANEL REMOVAL section 8 for instructions on your furnace. Once the control panel has been pulled out of the front of the furnace 30cm to 40cm (6 inches), the old battery can be removed. The battery is located near the front center of the computer/power pc board. Remove the tape, then using a small screw driver, remove the old battery. Replace it with a new battery with the positive "+" side to the top. (The battery bracket should be opened only a small amount so that it is not deformed. Replace the control panel and reapply power. The battery replacement will cause the control to lose complete memory. NOTE: THE POWER MUST BE APPLIED SHORTLY AFTER BATTERY REPLACEMENT OR THE BATTERY WILL BE DEAD WITHIN SEVERAL HOURS. Go to configuration setup below.

CONFIGURATION SETUP:

When powered up for the first time after battery replacement, the control will display a series of furnace model numbers (ie 525, 160A, 1350A). Press the ENTER key when the correct model number of the furnace being worked on appears. A pattern similar to "SELECT" will appear to indicate configuration setup. Pressing the 9 key followed by the ENTER key will place the control in the normal operating mode. See the CONFIGURATION SETUP in the programming section 6 for details on possible operating mode changes.

MUFFLE REPAIR:

The 6-525 furnace muffle is constructed of a lightweight fiber insulation. Exercise caution to prevent punctures or tears in the muffle when loading and unloading the furnace. Punctures exposing the heating elements embedded in the insulation may significantly shorten muffle life. The accessory ceramic tray provided with the furnace should be used to protect the muffle floor.

Damage to the fiber insulation in the muffle or the door can be repaired. A bottle of "Fiber Harding Agent" has been included with your furnace shipment.

The "Fiber Harding Agent" is a binding solution with the viscosity of water. It will harden the surface which was damaged. Directions for using this material are listed below:

- 1. Unplug the furnace and allow to cool**
- 2. Apply liquid hardening agent generously to the damaged area with a small brush or swab.**
- 3. Plug in the furnace and heat to 250C(500F) for approximately two hours or until the agent is dry or solid. Allow the furnace to run longer if the material is not dry.**
- 4. After the agent is solidified the furnace is ready for normal use.**

SERVICE

This section is provided as assistance to qualified service personnel. If you are qualified to service the furnace, please read the entire manual before you attempt any servicing.

IF YOU ARE NOT QUALIFIED TO SERVICE THE FURNACE, PLEASE READ THE PARAGRAPH BELOW, AND FOLLOW THE DIRECTIONS SPECIFIED.

If the unit requires service, review pages 8-2 and 8-3 before contacting the service department at your dealer or The J. M. Ney Company, Yucaipa, CA. Describe the particular problem and give the model and serial numbers of the furnace. This information is located on the data plate attached to back of the furnace. An RMA (Return Material Authorization) number will be assigned to your unit as a control during the repair period. The RMA number must appear on the shipping label so we can give you fast and dependable service.

Preparation For Return Shipment:

- 1 - The furnace muffle interior should be emptied of all trays and work pieces.**
- 2 - The exhaust tube on 525 units should be removed and stored for use upon the return of the furnace.**
- 3 - The original packing materials should be used for return shipment. If they are not available, new materials can be purchased for a nominal fee.**
- 4 - Equipment damaged in shipment as the result of improper packing may not be paid for by the carrier. The J. M. Ney Company will not be responsible for equipment damaged in return shipment due to improper packing.**

Ship the furnace shipping costs prepaid to:

**The J. M. Ney Company
RMA # _____
13553 Calimesa Boulevard
Yucaipa, CA 92399-2398**

**(714) 795-2461
FAX: (714) 795-5268**

TROUBLESHOOTING and ERROR CODES:

(See 5.0.0 Below for the "ERR" codes)

Review the following list of questions and suggestions before calling the service number listed on the previous page. Some of the answers may prove helpful in helping us solve the problem.

1.0.0 Shipping damage: SEE SECTION 2 RECEIVING INFORMATION

2.0.0 No operation - Furnace Dead - Display does not lightup , LED's do not come on, and muffle does not heat.

2.1.0 Does the power receptacle have power? Test with another load (ie lamp or radio.)

2.2.0 Does furnace beep when power is turned on? If yes, go to 2.3.0. If no, go to 2.9.0.

2.3.0 Do any of the LED's on the control/power board light? Look into rear back vents of furnace. If yes, check pc board to pc board connections.

2.9.0 Please note the answers to the following questions before calling the service telephone number listed on page 8-1.

What is model number and serial number of furnace? (List on data plate on back of furnace.)

Did furnace ever operate? For how long?

3.0.0 No Heat - Display and LED's operate.

3.1.0 Does the display show "ERR 2"? See Section 5.3.0 below.

3.2.0 Does the neon light on the control/power board light when the power switch is turned on? If not, check muffle continuity with ohm meter. If so, check wiring and terminals between muffle, triac, and control/power pc board.

3.3.0 Does the neon light flash off and on when the start key is pressed? Does LED DS1 (upper lefthand corner of control/power pc board) flash opposite the neon light (on to off)? If not, go to point 2.9.0 above.

4.0.0 Furnace operates, but not correctly:

4.1.0 Does RATE LED flash slowly when program is operating?

The RATE parameter is programmed faster than furnace can heat or cool. Unit will continue to operate but with a slower rate than programmed. See Heating Curves in Section 5.

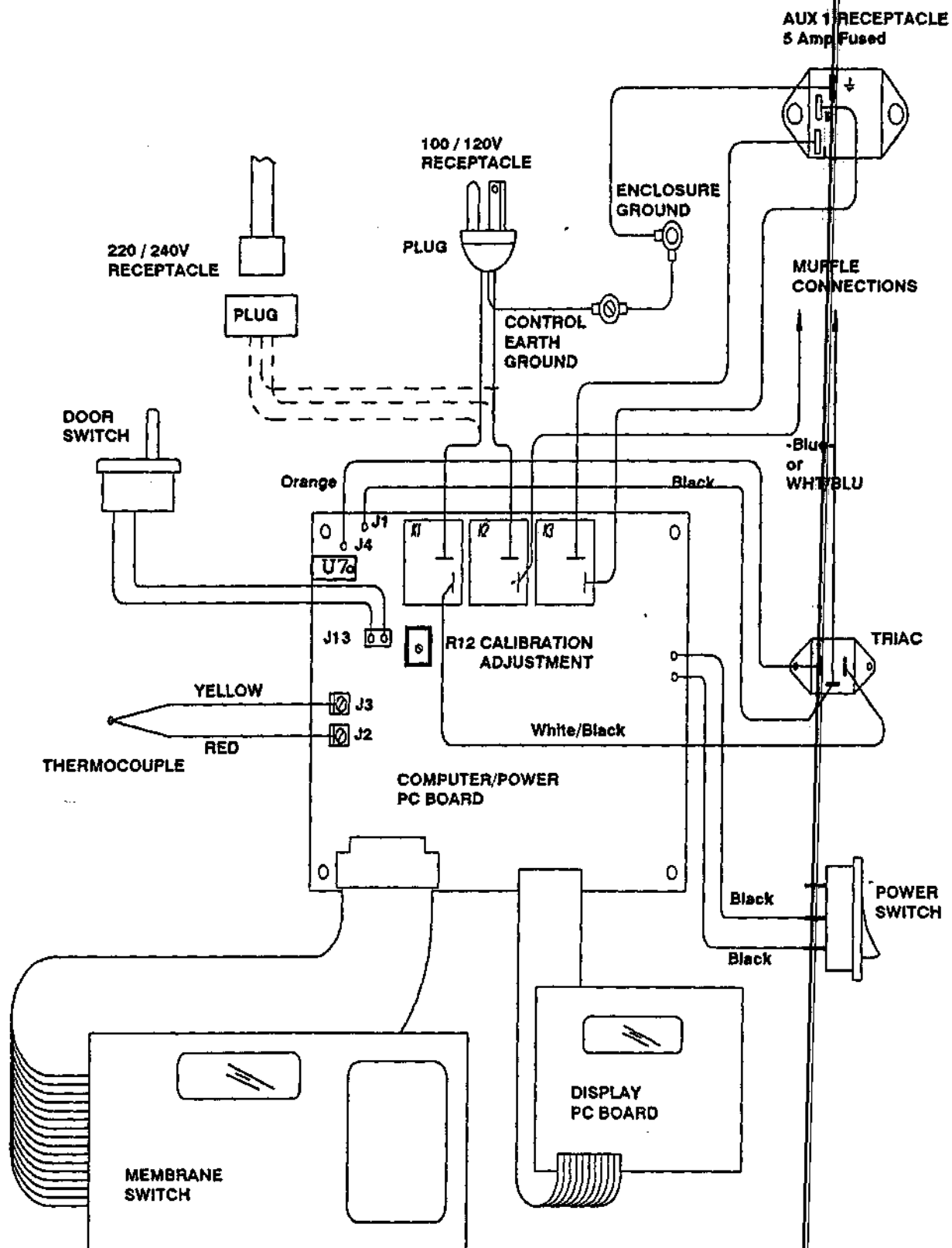
4.2.0 Control lost all preprogrammed parameters when turned off. Programming not saved when power is turned off. Did "LO BATT" indicator flash? Battery dead or not seated properly. See 5.1.0 below.

- 4.3.0 Cabinet around the door is discoloring. ("A" models only) Remove exhaust port ball plug if air exchange fan or compressed air fitting is being used.**

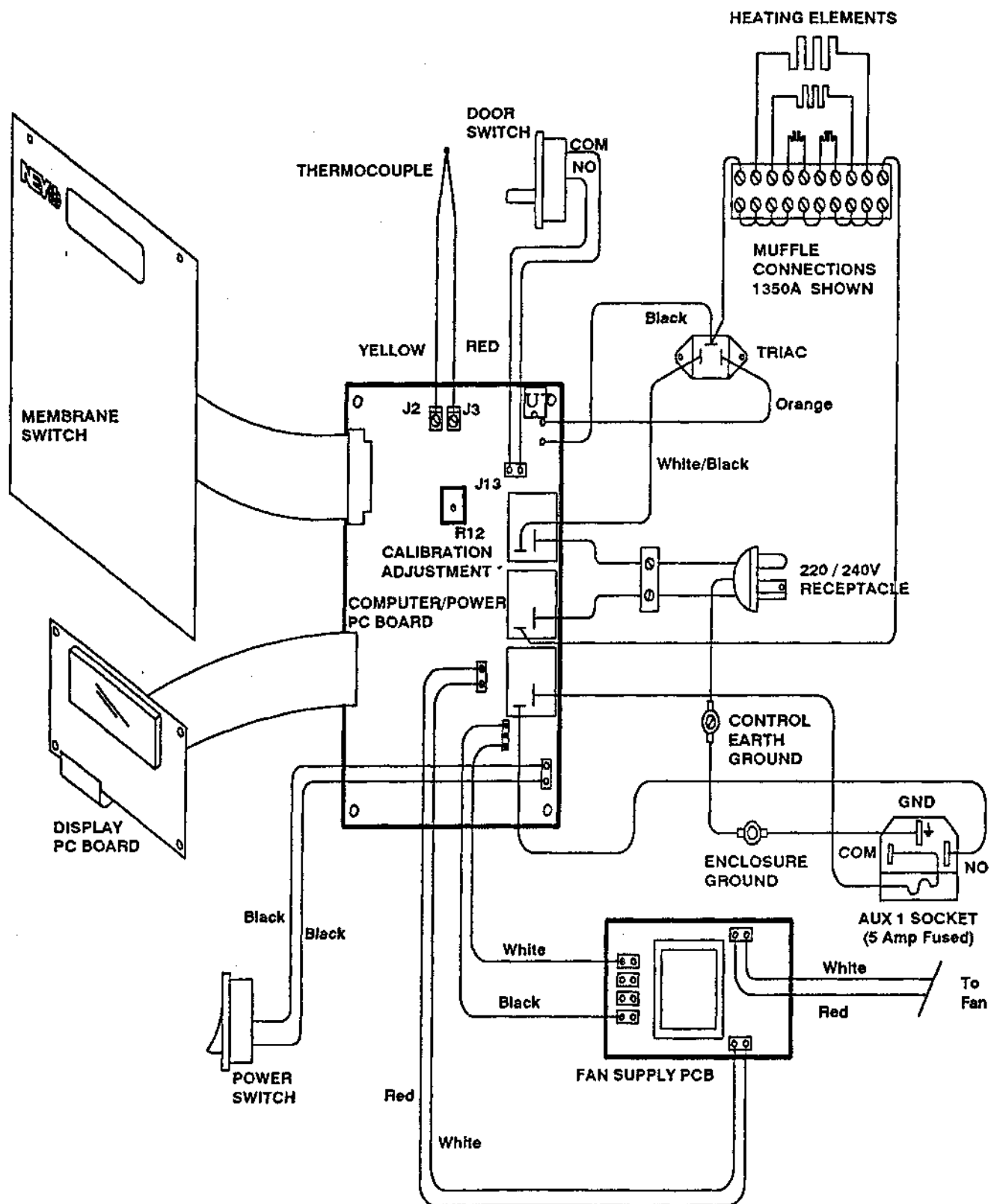
5.0.0 Abnormal Display Signals and Operation:

- 5.1.0 Lower Right Decimal Point Flashes In Display: "LO BATT" Battery is low or dead, replace with a number 2032 Lithium coin type. See MAINTENANCE SECTION 7 and SERVICE PARTS SECTION 9.**
- 5.2.0 ERR 1 is displayed: The muffle temperature is above 1100C (2012F) or overtemperature. Possible problems include: shorted output triac, shorted optotriac (U7) on control/power pc board, wiring shorted, thermocouple pushed back out of muffle, thermocouple shorted outside of muffle.**
- 5.3.0. ERR 2 is displayed: The control thermocouple is open or disconnected. Possible problems include: thermocouple disconnected at control/power pc board, thermocouple weld inside muffle open or damaged.**
- 5.4.0. ERR 3 is displayed: The control is attempting to go above the Programmable High Limit Cutoff. Review the section on programming the Cutoff in the programming section 6.**
- 5.5.0 "DOOR" remains on display when door is closed. Check door switch continuity. Check door switch actuator tab by listening for switch click as door closes.**

6-525 SCHEMATIC:



6-160A and 6-1350A SCHEMATIC:



DISASSEMBLY INSTRUCTIONS:

READ THE CAUTIONS ON PAGES 1-1 AND 1-2 BEFORE PROCEEDING!

DISCONNECT THE FURNACE LINE CORD FROM THE WALL RECEPTACLE/OUTLET. Refer to the schematics and the exploded view drawings for the appropriate furnace during servicing.

Respiratory, eye, and hand protection should be worn during the following procedures.

The following tools are required for disassembly/reassembly work described in this section.

- * Small blade screwdriver
- * Needle nose pliers

- * Medium Phillips screwdriver
- * Regular pliers

6-525 SERVICE:

6-525 CONTROL PANEL REMOVAL:

(Access to pc boards, trlac, power switch, door switch, thermocouple and muffler wiring connections)

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
2. Remove 9 screws from around the top, sides, and bottom of the control panel. Hanging the front of the furnace off of the counter by 2 inches (50mm) will aid in removing the bottom screws.
3. The control panel can now be removed by pulling it out the front of the furnace while raising the panel up slightly. The control panel will slide out approximately 6 inches (150mm).
4. With the control panel pulled out, various connections can be accessed. The pc boards are replaceable along with the membrane switch panel with its mounting plate with the drawer out. The control can be examined at this point along with battery replacement and temperature calibration.
5. If the control panel is to be completely removed, the wiring connections should all be noted, labeled, or verified with the schematic included in this manual.
6. Reverse the steps above for reinstallation making sure that all electrical connections are tight.

6-525 THERMOCOUPLE REMOVAL:

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.

2. Remove Control Panel by following the instructions above.
3. Disconnect thermocouple red and yellow wires from the left-hand side of the computer/power pc board. Disconnect the blue or blue/white muffle wires from computer/power pc board and triac.
4. Remove the exhaust port by removing the 3 retaining screws.
5. Remove Front Panel from enclosure by removing 7 screws from top and sides.
6. The Front Panel with the muffle attached pulls out of the front of the enclosure.
7. The thermocouple can now be removed from the back of the muffle by pulling it out.
8. Route the thermocouple through the bushing in the rear of the heatshield and behind the door switch bracket.
9. Reverse steps 1-6 for reinstallation. (Note: The screws holding the front panel to the cabinet must be installed prior to installing the control panel.

6-525 MUFFLE REMOVAL:

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
2. Remove Control Panel by following the instructions above.
3. Remove the exhaust port by removing the three retaining screws.
4. Disconnect the blue or blue/white muffle leads from the triac and the power board.
5. Remove the thermocouple by pulling it out of the muffle. Follow the instructions above if thermocouple to be replaced.
6. The muffle can now be removed by releasing the two springs that hold it in position. **USE CAUTION WHEN RELEASING OR INSTALLING THE SPRINGS!** Using pliers, release spring on end farthest from you. This will prevent it from flying at you if your grip should slip.
7. When installing the muffle, make sure that the muffle is pressed tightly against the front panel. the muffle wires must be fed through the two bushings in the front of the heatshield.
8. Reverse steps 1-6 for reinstallation. Gloves and protective eyewear should be worn when installing the springs.

6-160A SERVICE:

6-160A CONTROL PANEL REMOVAL:

(Access to pc boards, triac, power switch, door switch, thermocouple and muffle wiring connections)

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
2. Remove 9 screws from around the top and bottom of the control panel. Hanging the front of the furnace over a counter by 2 inches (50mm) will aid in removing

- the bottom screws.
3. The control panel can now be removed by pulling it out of the front of the furnace while raising the panel up slightly. The control panel will slide out approximately 6 inches (150mm).
 4. With the control panel pulled out, various connections can be accessed. The PC boards are replaceable along with the membrane switch panel with its mounting plate. The control can be examined at this point along with battery replacement and temperature calibration.
 5. If the control panel needs to be completely removed, the wiring connections should all be noted, labeled, or verified with the schematic included in this manual.
 6. Reverse the steps above for reinstallation making sure that all electrical connections are tight.

6-160A MUFFLE REMOVAL:

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
2. Remove the Control Panel by following the instructions above for Control Panel Removal.
3. Disconnect the blue or blue/white muffle leads from the triac and the power board.
4. Remove the eight Phillips screws from the back panel.
5. Open the door and remove the 3 screws along the bottom front of the muffle.
6. Remove the thermocouple from the back of the furnace.
7. Remove the muffle lead wires from the muffle terminals.
8. Remove the exhaust port by removing the three retaining screws.
9. Slide the muffle out the back of the furnace enclosure.
10. To reinstall, slide the muffle into the grooves in the rail and reverse steps 1-7.

6-160A THERMOCOUPLE REMOVAL (TYPE K):

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
2. Remove the Control Panel by following the instructions above for Control Panel Removal.
3. Follow steps 4+6 of the muffle replacement procedure.
4. Disconnect thermocouple red and yellow wires from the left-hand side of the computer/power board and remove thermocouple.
5. Reverse steps 1-4 to reinstall.

6-1350A SERVICE:

6-1350A CONTROL PANEL REMOVAL

(Access to pc boards, triac, power switch, door switch, also thermocouple and muffle wiring connections)

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
2. Remove the rear electrical panel (3 screws in lower left of furnace back, looking from the rear.) and lay it to the side. The retaining screw for the control module is located above and inside the furnace.
3. Push on this screw as it is removed. The control panel will slide out the front. The control panel can be pulled out approximately 6 inches before any wires need to be disconnected.
4. Refer to the schematic/wiring diagram (page 8-5) before removing any wires. Calibration can be done in this position and most of the other possible service requirements such as PC board replacement, triac replacement, and troubleshooting.
5. To replace the control panel assembly, reverse the disassembly procedure.

6-1350A MUFFLE PLATE REMOVAL:

Each of the four ceramic plates have heating element wires within the plate. Each plate can be replaced individually if a failure occurs.

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
 2. Remove the furnace back by removing the back panel screws.
 3. Remove the thermocouple from the muffle and push it back into the control section.
 4. Disconnect the power leads connecting the muffle to the control section. Disconnect all of the individual muffle plate connections from the terminal block.
 5. Remove the 6 screws which hold the muffle back to the muffle, then remove the aluminum back.
 6. Remove the exhaust port tube by removing the 3 retaining screws.
 7. Remove the rear fiber brick from the back of muffle. It will slide out the back while the leads are fed through it. **TAKE CARE NOT TO DAMAGE THE BRICK.**
- Note: Each plate supports the others. The sides or top plates will fall unless adequate support is provided.
8. Slide the top plate out the back while supporting the others. Continue with the sides and then the bottom plate.
 9. The muffle can now be reassembled using the new part.
 10. To reassemble, reverse the procedure and use the following precautions:
 - Fiber rope used between top plate and top brick must be put back in place.

- Fiber rope used between back brick and rear edges of plates must be reinstalled to prevent air from flowing into the chamber before preheating.

6-1350A THERMOCOUPLE REMOVAL:

1. Turn off the power to the furnace and remove the line cord from the wall receptacle/outlet. Allow the furnace to cool to room temperature before starting service.
2. Remove the furnace back by removing the back panel screws.
3. Remove the control module assembly. (See the Control Panel Section) NOTE: Disconnect only the thermocouple and thermocouple strain relief.
4. Pass the thermocouple leads through the back of the control module housing.
5. Remove thermocouple from the back of the muffle.
6. To replace the thermocouple, reverse the above procedure.

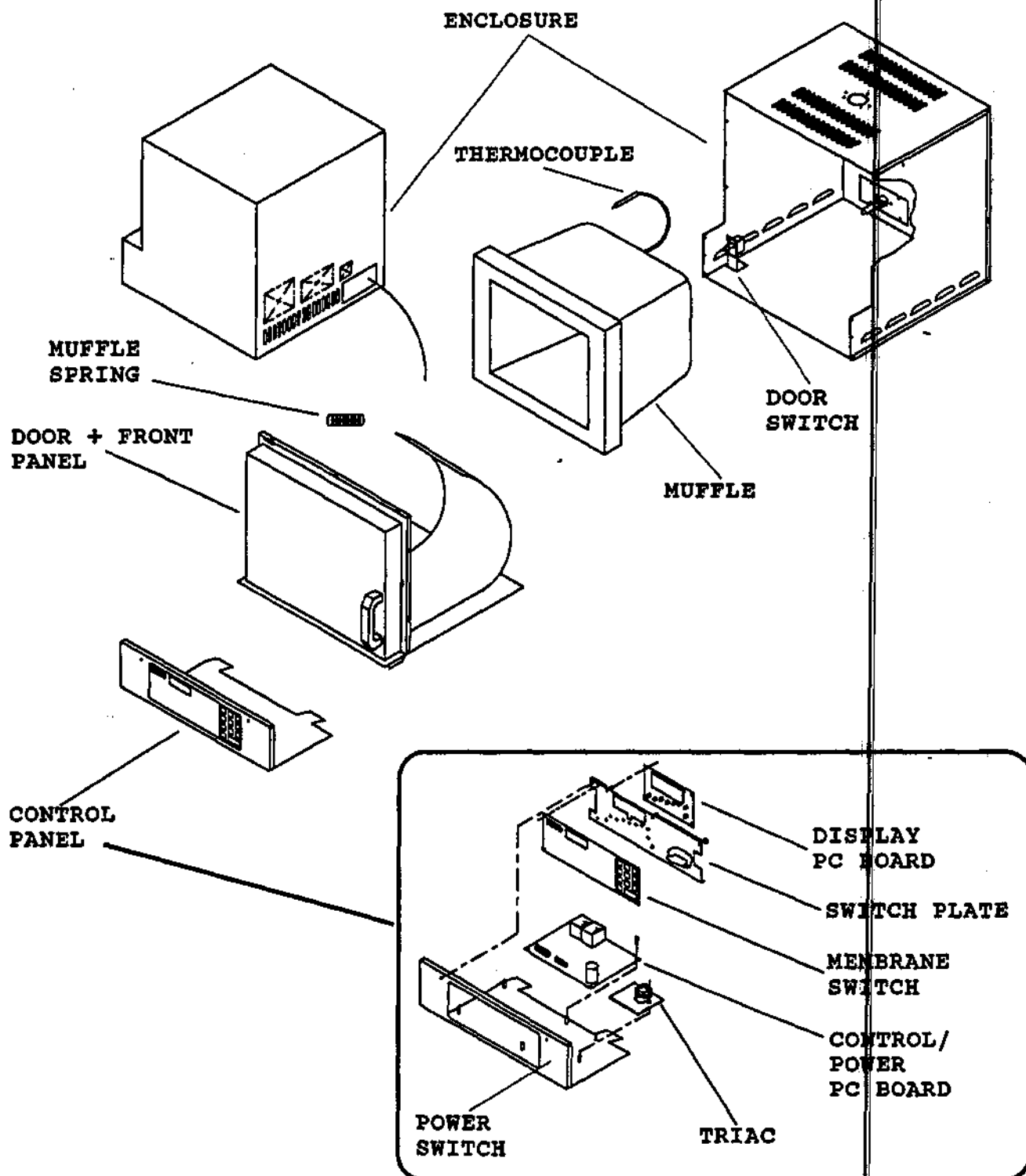
REPAIR PARTS

The furnace and its internal components and assemblies are delicate and need to be packed properly for return shipment. Pack all parts or assemblies in a bag then foam and seal them in suitable boxes. Use original packaging when it is available.

FURNACE 6-525

DESCRIPTION	VOLTAGE			
	100V	120V	220V	240V
Muffle Thermocouple	R9491042	R9491040	R9491041C	R94919041B -----R9491747-----
Triac Power Switch		-----R9303015----- -----R9306021-----		
Door Switch		-----R9492666-----		
Control/Power PC Board Assembly		-----R9492572-----	-----R9492573-----	
Display PC Board Assembly		----- R9492703 -----		
Membrane Switch and Switch Plate		----- R9492636 -----		
Battery, Lithium Panasonic Part Number BR2032 Radio Shack Number CR2032		Obtain Locally		
Fuse, 1 Amp, 250V, 5mm x 20mm		Obtain Locally		

EXPLODED VIEW 6-525:

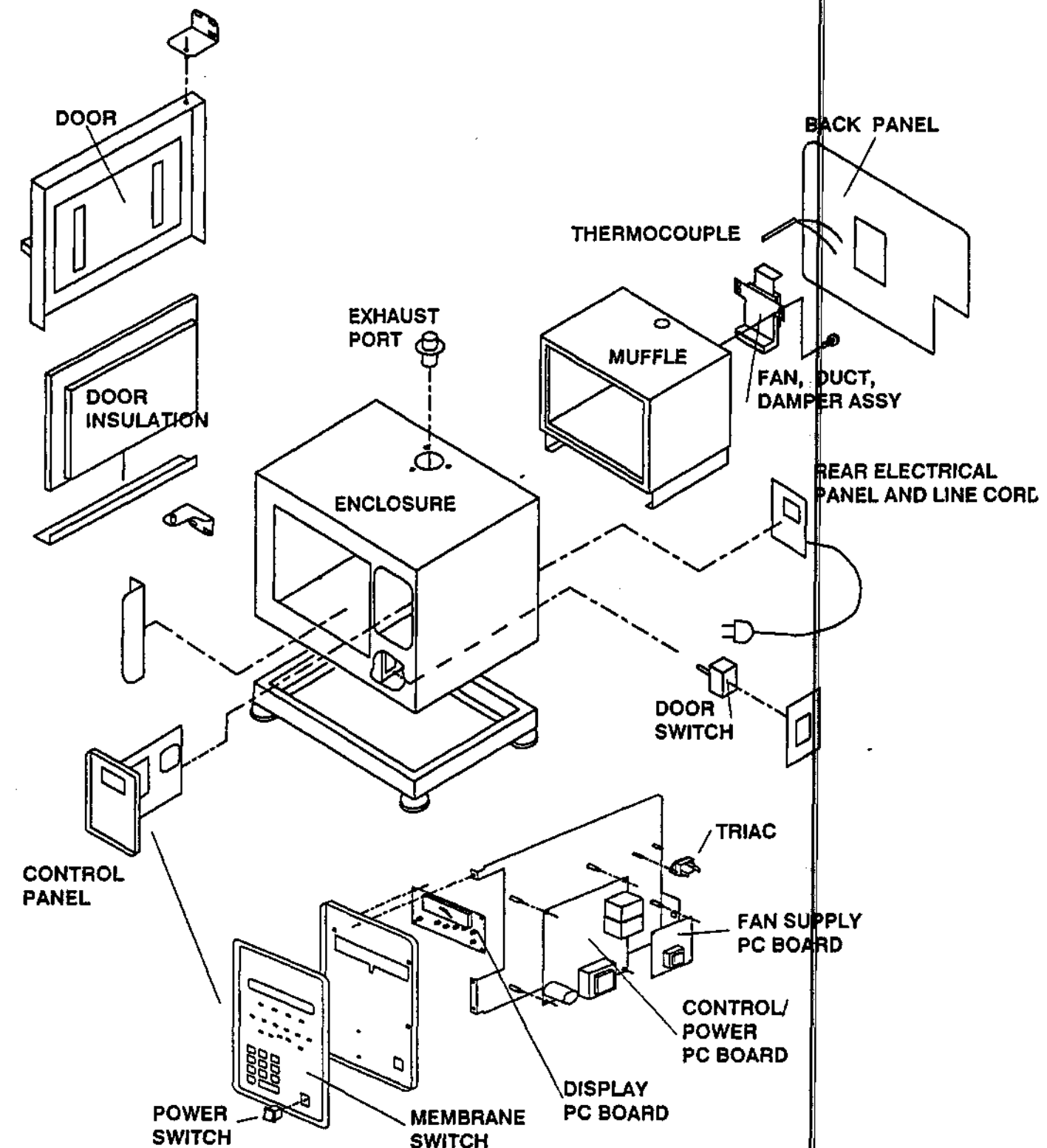


FURNACE 6-1350A

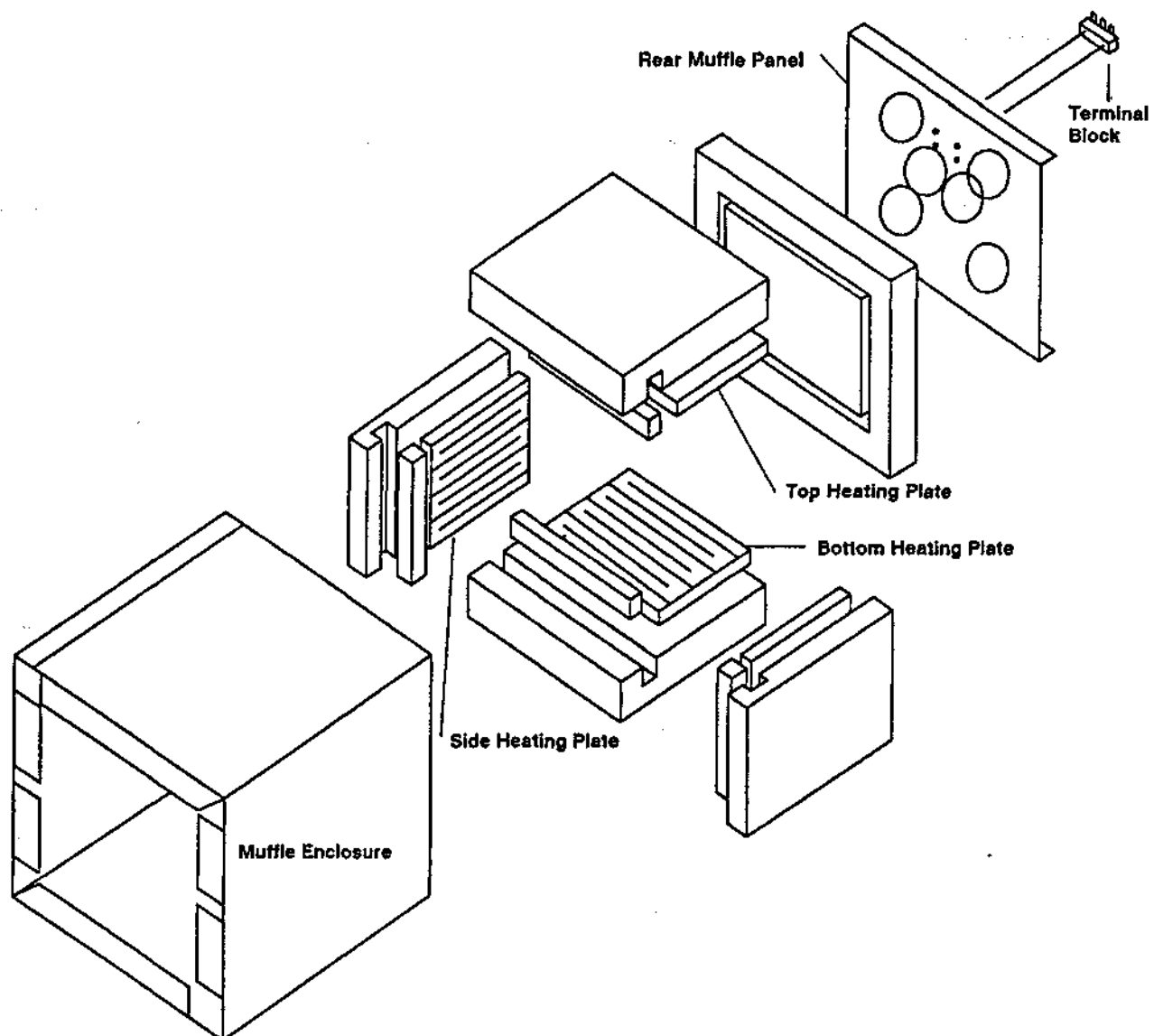
The furnace and its internal components and assemblies are delicate and need to be packed properly for return shipment. Pack all parts or assemblies in a bag then foam and seal them in suitable boxes. Use original packaging when it is available.

DESCRIPTION	VOLTAGE 220V - 240V
Top + Bottom Heating Plate Side Heating Plate	R9492684 R9492683
Triac Power Switch	R9303015 R9306021
Door Switch Thermocouple	R9492666 R9491747
Control/Power PC Board Assembly	R9492573
Display PC Board Assembly	R9492707
Membrane Switch and Switch Plate	R9492659
Air Exchange Fan, 12 VDC Fan Supply PCB Assy	R9492455 R9492710
Battery, Lithium Panasonic Part Number BR2032 Radio Shack Number Cr2032	Obtain Locally
Fuse, 1 Amp, 250V, 5mm x 20mm	Obtain Locally

EXPLODED VIEW 6-1350A:



EXPLODED VIEW 6-1350A MUFFLE:

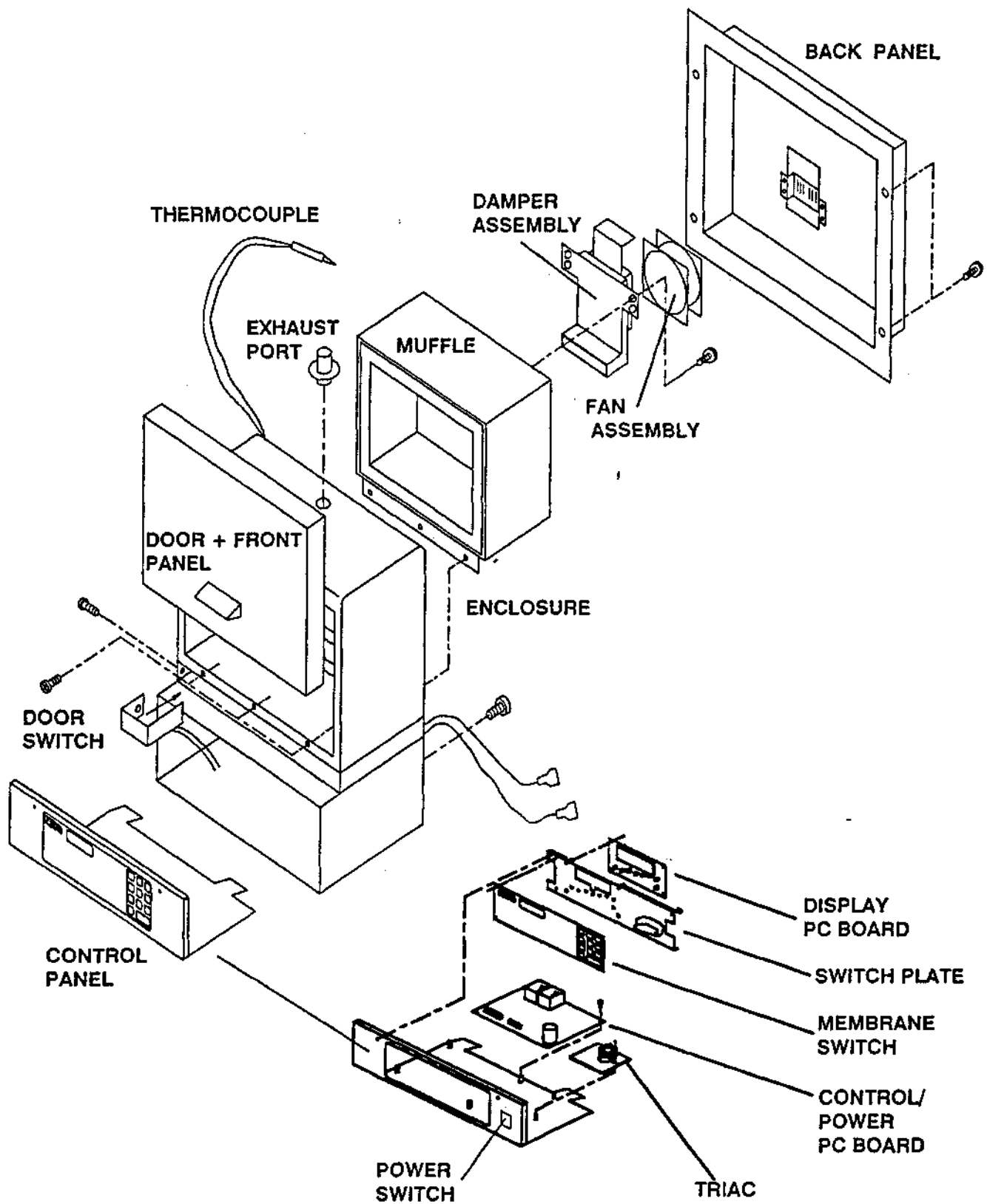


FURNACE 6-160A

The furnace and its internal components and assemblies are delicate and need to be packed properly for return shipment. Pack all parts or assemblies in a bag then foam and seal them in suitable boxes. Use original packaging when it is available.

DESCRIPTION	VOLTAGE			
	100V	120V	220V	240V
Muffle 6-160A	R947777	R947777	R9477777	R947777
Thermocouple Triac		-----R9491747----- -----R9303015-----		
Power Switch Door Switch		-----R9306021----- -----R9492666-----		
Control/Power PC Board Assembly		----R9492570----	-----R9492571-----	
Display PC Board Assembly		----- R9492702 -----		
Membrane Switch and Switch Plate		----- R9492777 -----		
Air Exchange Fan Fan Supply PCB Assy		R9492777 R9492777		
Battery, Lithium Panasonic Part Number BR2032 Radio Shack Number CR2032		Obtain Locally		
Fuse, 1Amp, 250V 5mm x 20mm		Obtain Locally		

EXPLODED VIEW 6-160A:



ACCESSORIES

DESCRIPTION	ORDER NUMBER
Tongs - Stainless Steel 10" (25cm)	9390014
Tongs - Stainless Steel 12" (30cm)	9390015
Tongs - Plated Steel 14" (36cm)	9491010B
Tray - Hard Ceramic (3.75" * 4") (9.5cm * 10cm)	9390017
Tray - Hard Ceramic (8.0" * 8.0") (20cm * 20cm)	9353027
Shelf - Honeycomb ceramic 1.75" (4.5cm) in height 3.0" (7.6cm) in height	9492211 9492210
Muffle Hardening Agent (6-525 only)	9491006
Temperature Pellets - Bottle of 25 705C (1300F) 815C (1500F)	9490911 9490912A
Exhaust port ball plug - 2 each Small (6-525, 6-160A) Large (6-1350A)	9491093A 9492456

LIMITED WARRANTY and LIMITATION OF LIABILITY

1. WARRANTY: Except with respect to those components parts and uses which are hereinafter described, The J.M. Ney Company warrants this furnace to be free from defects in material and workmanship for a period of one year from the date of sale. The J.M. Ney Company's liability under this warranty is limited solely to repairing or, at Ney's option, replacing those products included within the warranty which are returned to Ney within the applicable warranty period (with shipping charges pre-paid), and which are determined by The J.M. Ney Company to be defective. This warranty shall not apply to any product which has been subject to misuse; negligence; or accident; or misapplied; or modified; or repaired by unauthorized persons; or improperly installed.

2. WARRANTY EXCLUSIONS: The warranty described in Paragraph 1 does not include normal wear of Ney's product or its components. The muffle, a component of Ney furnaces, has a warranty period from the date of sale as outlined in the table below.

FURNACE MUFFLE	LENGTH OF WARRANTY
6-160A	6 Months
6-525	60 Days
6-1350A	6 Months

3. INSPECTION: Buyer shall inspect the product upon receipt. The buyer shall notify The J.M. Ney Company in writing of any claims of defects in material and workmanship within thirty days after the buyer discovers or should have discovered the facts upon which such a claim is based. Failure of the buyer to give written notice of such a claim within this time period shall be deemed to be a waiver of such claim.

4. DISCLAIMER: The provisions here-in stated The J.M. Ney Company's sole obligation and exclude all other remedies or warranties, expressed or implied, including those related to MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE.

5. LIMITATION OF LIABILITY: Under no circumstances shall The J.M. Ney Company be liable to the buyer for any incidental, consequential or special damages, losses or expenses.

6. LIMITATION OF ACTIONS: The buyer must initiate any action with respect to claims under the warranty described in the first paragraph within one year after the cause of action has accrued.

Corporate Offices:

**The J.M. Ney Company
Ney Industrial Park
Bloomfield, CT 06002
203-242-2281
Tlx 6288-7937
FAX 203-242-5688**

Built and Repaired at:

**The J.M. Ney Company
13553 Calimesa Boulevard
Yucaipa, CA 92399
714-795-2461
FAX 714-795-5268**

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